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FAMILY HISTORY: No previous typhoid in the immediate family; mother of patient has had frequent gall stone attacks for six or seven years. The focal list shows the following cases of typhoid in associates and relatives of the family in previous years: 1917—A minister, Wm. H., and Mrs. E. S., an aunt of the patient, both frequent visitors. 1918—Kate S., an aunt of the patient, and her housekeeper, Mary C. (see VISITORS), also Walter C., employed at the creamery of C. M. S., where the patient's father sells his milk; all associates of the A family. 1919—James S. and Mrs. F. S., aunt and uncle of the patient. 1920—C. M. S., creameryman, cousin of the patient, and Earl P., a cousin. (Contact of these cases with the A family could not be definitely shown to have occurred within 30 days of onset.)[4]

HISTORY OF TYPHOID IN PERSONAL CONTACTS: There was no history of contact within 30 days of onset with persons appearing on the focal lists, or otherwise known to have had typhoid, with the exception of that given under "VISITORS."

VISITORS: Two persons appearing on the focal list visited the A home almost every week, Kate S., aunt of the patient, and Mary C., her housekeeper. Both had typhoid in September, 1918. Both frequently ate meals at the A home.

CONTACT WITH UNREPORTED CASES: None.

SUSPECTED SOURCES: Mrs. Foster A., suspected carrier;[5] Kate S., suspected carrier; Mary C. suspected carrier; polluted drinking water, farm of Jos. R.

### Populations.

*Washington County.*

| Town. | Population. | Focal area. |
|---|---|---|
| Washington County | 59,691 | ........ |
| Hancock | 972 | W-1 |
| Williamsport | 1,615 | W-2 |
| Funkstown | 620 | W-2 |
| Sharpsburg | 832 | W-3 |
| Boonesboro | 1,044 | W-5 |
| Keedysville | 394 | W-5 |
| Smithsburg | 586 | W-7 |
| Clear Spring | 538 | ........ |
| Hagerstown | 28,034 | ........ |

*Frederick County.*

| Town. | Population. | Focal area. |
|---|---|---|
| Frederick County | 52,541 | ........ |
| Middletown | 749 | F-2 |
| Brunswick | 3,905 | F-3 |
| Burkittsville | 200 | F-3 |
| Thurmont | 1,074 | F-4 |
| Emmitsburg | 940 | F-4 |
| Point of Rocks | 365 | F-6 |
| Walkersville | 596 | F-7 |
| Woodsboro | 385 | F-7 |
| New Market | 274 | F-8 |
| Frederick | 11,056 | ........ |

## SMALLPOX OUTBREAK IN GLASGOW SHOWS EFFICACY OF VACCINATION.

Recent figures indicate an increasing prevalence of smallpox. Within the past five years, epidemics have occurred in Scotland, Germany, France, Spain, Australia, Burma, the Philippines, Mexico, Brazil, Argentina, Chile, Costa Rica, Santo Domingo, Canada, and parts of the United States. Case rates per 1,000 population for certain

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[4] On account of time elapsing between their attack and demonstration of carrier No. 10, they were not classified as cases having definite contact with a known carrier within 30 days of onset.

[5] Feces culture showed *B. paratyphosus Beta* (carrier No. 10).

States of the United States for the first nine months of the years 1920 and 1921,[1] and the median for the years 1913–1920 are as follows:

| Year. | Number of States. | Estimated population. | Case rate, January–September. |
|---|---|---|---|
| 1921 | 41 | 90,907,540 | 1.21 |
| 1920 | 40 | 87,602,619 | 1.06 |
| Median, 1913-1920 | 39 | 85,472,801 | .60 |

The smallpox case rates of 20 States (4 Eastern, 7 Southern, 6 Central, and 3 Pacific) from 1915 to 1920 were as follows: 1915, 0.24; 1916, 0.20; 1917, 0.16; 1918, 0.16; 1919, 1.66; 1920, 2.38.

The number of cases in 1921 in 93 cities was reported by the Metropolitan Life Insurance Co. to be 138 per cent greater than that in 1920; and while the number of cases doubled, there were six times the number of deaths in proportion to the number of cases, the case fatality rate rising from 2 per 1,000 in 1920 to 13 per 1,000 in 1921.

The Bureau of the Census gives the death rates per 100,000 population in the registration area for the successive years 1916 to 1920, respectively, as follows: 0.2, 0.3, 0.4, 0.4, and 0.6.

In view of this increasing prevalence of smallpox and evidence that the disease is becoming more virulent as well as more common, recent data bearing upon the extent and efficacy of vaccination are worthy of widespread publicity. The following report is quoted from The Medical Officer for July 8, 1922:[2]

After a period of 20 years' comparative immunity from smallpox Glasgow was visited in 1920 and the early part of 1921 with an outbreak of smallpox. During this period 578 cases were notified. Twenty years previously (1900–1902) an outbreak of smallpox in Glasgow occurred, with 2,255 cases, and in the following two years (1903–1904) 1,158 cases were reported. The 1920 outbreak was traced to India and Egypt. *The character of this source of invasion differs much from the type introduced from America, and is invariably much more severe.*[3] * * *

A valuable and interesting addition has been made to the history of epidemiology in the annual report (1920) of Doctor Chalmers, medical officer of health for the city of Glasgow, which includes an instruction report contributed by Dr. A. S. W. Macgregor, D. P. H., etc., senior assistant medical officer, Glasgow, * * *.

The details given of the Glasgow epidemic confirm and substantiate the claims of those who advocate vaccination.

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[1] It is noted that reports to the United States Public Health Service from 39 States (including the District of Columbia) show a large reduction in the number of cases of smallpox for the first six months of 1922 as compared with the corresponding period of 1921. The number of cases reported by these States for the first half of 1921 was 73,448, as against 20,614 for the first half of 1922—a decrease of 52,834, or 71.9 per cent.

[2] Some Vaccination Aspects: Glasgow Smallpox Epidemic, 1920-21. The Medical Officer, July 8, 1922. Public Vaccination Service Notes, pp. 3, 4.

[3] Italics not in original report.

## RECENT VACCINATION.

In 1920, during the prevalence of smallpox in Glasgow, it is stated that there were no less than 225,861 vaccinations and revaccinations at the public expense. Doctor Macgregor adds 124,000 as an estimate of the number done in the ordinary course of infantile vaccination, and estimates a further 100,000 ex-service men who were vaccinated during the war. (It is certain also that over 400,000 of the population were vaccinated or revaccinated during the epidemic of 20 years ago.) This mass of vaccinal protection for the city may truly be said to have had its effect on the 1920 outbreak. The greatest test of the efficacy of vaccination is that during epidemics of smallpox in these days practically all known contacts are vaccinated or revaccinated. Having regard to the extraordinary immunity of contacts so protected, and of doctors, nurses, and smallpox hospital staffs, it is surprising that any reasoning person can contest the claim that recent vaccination protects from smallpox attacks.

In prevaccination days this disease was mainly a disease of childhood. Ever since the introduction of vaccination there has been a shifting of the age incidence of smallpox. In prevaccination days the bulk of the population contracted smallpox—those who survived were immunized (though often disfigured and in various other ways permanently damaged). Since the introduction of vaccination that has been changed. At the present time the adult population of this country is in a better state than it has been since the eighteenth century as regards protection from smallpox. This has been brought about by the millions of vaccinations among service men in the Army and Navy during the Great War. Not so the child population, which is becoming less and less protected, owing to the operation of the vaccination act (1907), the effect of which has been to increase enormously the neglect of the vaccination of infants. Doctor Macgregor draws special attention to this and refers to the tendency to return to the age incidence of smallpox, as in the days before vaccination was introduced. Doubtless this will be more apparent in subsequent epidemics.

On this point he says:

> The relaxation of the vaccination laws in 1907 has been largely taken advantage of in Scotland. Since that year the proportion of unvaccinated children has been gradually increasing, resulting in the exposure to infection of the more susceptible ages of the population. As might have been expected, and as the event showed, the present invasion of smallpox has tended to fall more heavily among the unvaccinated.

The following table shows the age incidence and mortality among children during the Glasgow outbreak. Striking differences between the vaccinated and the unvaccinated are recorded. The very convincing contrasts should be carefully noted, affording as they do ample proof of the soundness of the case for vaccination:

*Attacks among children, Glasgow, 1920–21.*[1]

| Age group. | Vaccinated. | Died. | Mortality. | Unvaccinated. | Died. | Mortality. |
|---|---|---|---|---|---|---|
| | | | *Per cent.* | | | *Per cent.* |
| 0–1 | 0 | 0 | 0 | 16 | 11 | 68.7 |
| 1–5 | 1 | 0 | 0 | 32 | 11 | 34.3 |
| 5–10 | 8 | 0 | 0 | 41 | 10 | 24.3 |
| 10–15 | 21 | 0 | 0 | 23 | 6 | 26.0 |
| Total | 30 | 0 | 0 | 112 | 38 | 33.9 |

[1] This table includes 5 cases of children attacked after the publication of Doctor Macgregor's report, of whom 4 were unvaccinated.

Among the living in Glasgow at the time of the epidemic, there would be only a relatively small number of persons over the age of 15 years who had not been vaccinated in infancy, as the statistics of primary vaccination of children show that about 84 per cent were at that time vaccinated; and 10 per cent died before vaccination. At ages above 10 years it is known that vaccination (primary infantile vaccination) can not be relied on to prevent or diminish the liability to attack by smallpox. After the period of highest potency to protect from attack has lapsed, the Glasgow epidemic shows again that among the vaccinated at the later age periods there remains the power to modify the character and severity of the disease. In regard to the value of infant vaccination against not only attack but also death, the above table is instructive. It will be seen that amongst those who were attacked at ages up to 15 years, there were 30 vaccinated—of these none died. But among those unvaccinated at the same ages, there were 112 cases, with no less than 38 deaths.

## SMALLPOX MITIGATED, GLASGOW, 1920–21.

As showing the severity of the disease in relation to age and vaccination, Doctor Macgregor publishes the following table:

| | Vaccinated. | | | Unvaccinated. | | |
|---|---|---|---|---|---|---|
| | Number of cases. | Severe. | Percentage of severe. | Number of cases. | Severe. | Percentage of severe. |
| Under 15 years | 29 | 1 | 3.4 | 107 | 45 | 42.0 |
| Over 15 years | 367 | 58 | 15.8 | 15 | 11 | 73.3 |
| Total | 396 | 59 | 14.9 | 122 | 56 | 46.0 |

(After the above tables were compiled, additional cases of smallpox were notified—36 cases; of these there were no deaths and only one case at ages from 10–15 years in the vaccinated group.)

### DOUBTFUL CASES, GLASGOW, 1920–21.

Special mention is made of 21 "doubtful" cases. These had no vaccination cicatrix, nor any mark suggesting that they had been vaccinated before exposure to infection. Of these, 9 died. Only one of these cases was in the age group 10–15 years.

### SUMMARY.

No vaccinated person in the Glasgow epidemic (1920–21) under 15 years died.

At the ages 15–20 there were 62 cases vaccinated and only 2 deaths.

The mortality among the vaccinated in infancy fell chiefly among those in the age groups from 35 years and over.

On the other hand, the unvaccinated cases present a remarkable contrasting picture. No less than 112 cases out of a total of 128 were at the ages in the group 0–1–15 years. Of these, 38 died.

An analysis of the 112 cases (unvaccinated) is useful. Under 1 year of age were included 16 cases. Of these the large proportion of 11 died.

At ages 1–5 years, there were 32 children attacked. Of these, 11 died.

In the same group (112 cases of unvaccinated children) were 64 cases at ages 5–15 years; and of these, 16 died.

As Doctor Chalmers points out, the tables are well worth close examination, and show the value of vaccination against both attack and death in the earlier periods of life.

## DEATHS DURING WEEK ENDED AUGUST 19, 1922.

*Summary of information received by telegraph from industrial insurance companies for week ended August 19, 1922, and corresponding week 1921. (From the Weekly Health Index, August 22, 1922, issued by the Bureau of the Census, Department of Commerce.)*

| | Week ended Aug. 19, 1922. | Corresponding week 1921. |
|---|---|---|
| Policies in force | 49, 817, 308 | 45, 662, 669 |
| Number of death claims | 7, 425 | 6, 991 |
| Death claims per 1,000 policies in force, annual rate | 7. 8 | 8. 0 |